ARTICLE

A Facebook-Based Obesity Prevention Program for Korean American Adolescents: Usability Evaluation

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ABSTRACT

Introduction: Adolescent obesity is one of the most serious global public health challenges. Social networking sites are currently popular among adolescents. Therefore, the obesity prevention program for Korean American adolescents was developed on the most popular social networking site, Facebook. The purpose of this study was to evaluate the usability of a culturally tailored Facebook-based obesity prevention program for Korean American adolescents (Healthy Teens).
Method: An explorative descriptive design of usability testing was used. Usability testing employing one-on-one observation, the think-aloud method, audio taping, screen activity capture, and surveys was performed. Twenty participants were recruited from two Korean language schools (mean age, 15.40 ± 1.50 years). Recruitment and user testing was performed between February and April 2014. Content analysis, using the inductive coding approach, was performed by three coders to analyze transcriptions. Descriptive statistics were used to analyze quantitative data including demographic characteristics, perceived usability, eHealth literacy, and health behaviors.
Results: Testing revealed several usability issues in content, appearance, and navigation. Participants' comments regarding content were positive. Although the Facebook platform provided limited flexibility with respect to building the site, participants described the program's appearance as appropriate. Most participants did not experience difficulty in navigating the program.
Discussion: Our preliminary findings indicated that participants perceived the Healthy Teens program as usable and useful. This program could be used as a robust platform

for the delivery of health education to adolescents. Further research is required to assess the effects of Facebook-based programs on adolescent obesity prevention. J Pediatr Health Care. (2016) ■, ■-■.

The prevalence of obesity has increased dramatically in the United States, particularly in adolescents. The rate of adolescent obesity has quadrupled from 5% to 21% during the past 30 years (Ogden, Carroll, Kit, & Flegal, 2014). Preliminary evidence suggests that adolescent obesity can be improved via Web-based interventions that promote healthy eating and physical activity (Hamel & Robbins, 2013). Recently, the use of social networking sites (SNSs) has been fully integrated into adolescents' everyday lives. In fact, 95% of teens use the Internet, and 80% are SNS users (Lenhart et al., 2011). Facebook is currently the most popular platform for adolescents (eBizMBA, 2016). Facebook has a number of useful features, including image/video sharing functions and the absence of word limits in posting, that could enhance health education interventions. Therefore, the utilization of Facebook in adolescent health research may increase the likelihood of reaching adolescents and have an important influence on their health behaviors in a rapid and effective manner (Park & Calamaro, 2013). However, only a few researchers have conducted studies to examine the use of SNSs to prevent adolescent obesity (Cavallo et al., 2012; Napolitano, Hayes, Bennett, Ives, & Foster, 2013).

The Asian population is one of the most rapidly growing racial groups in the United States, and Korean Americans (KAs) are the fifth-largest Asian subgroup (U.S. Census Bureau, 2012). The prevalence of obesity in Asian American adolescents, including KA adolescents, is lower than the U.S. national average, at 10% for boys and 4% for girls (Wang & Beydoun, 2007). Nevertheless, second- and third-generation Asian immigrants have been shown to be more likely to be obese relative to their first-generation counterparts (Popkin & Udry, 1998). The increased risk of obesity in this group is most likely caused by acculturation such as changes in eating habits (Hauck, Hollingsworth, & Morgan, 2011). Acculturation occurs when there is continuous firsthand contact between different cultures, leading to cultural changes in either or both groups (Redfield, Linton, & Herskovits, 1936). KA immigrants' lifestyle changes are most likely due to acculturation resulting in obesity, which is more obvious in adolescents than in their parents (Kim & Wolpin, 2008). However, little research has been conducted to prevent KA adolescent obesity via physical activity and healthy eating. Moreover, no health education resources tailored to KA adolescents' diets and lifestyles are available.

BACKGROUND

Development of the Healthy Teens program on Facebook (Figure 1) was guided by two important theoretical frameworks: social cognitive theory (SCT) and the technology acceptance model (TAM). The content of the Healthy Teens program was based on SCT (Bandura, 1997, 1998). Three components of SCT (outcome expectations, goal setting, and self-efficacy) have been applied to the development of learning modules and discussion boards. The usability evaluation of the program was guided by the TAM (Davis, 1986; Venkatesh & Davis, 2000). The ultimate goal in developing the program was to reduce adolescents' unhealthy behaviors. For the program to be effective, adolescents must accept and use it. The TAM explains how users accept or reject new technology. If users perceive a new program as useful and easy to use, they will intend to use it, which will lead to actual use (Figure 2). Therefore, participants' perceptions regarding the program's usefulness and usability were assessed via usability testing.

The program included (1) four learning modules concerning adolescent obesity, healthy eating, and physical activity; (2) discussion forums; and (3) adolescent-friendly health-related resources in the form of videos, games, flash animations, and printable materials. The program content was developed by a team of experts in adolescent health and obesity, healthy eating and physical activity, and the KA population. Content was developed at a sixth-grade reading level. Learning modules were tailored to KA adolescents' culture. The content of learning modules was based on the information from both American and Korean government guidelines, including the National Physical Activity and Dietary Guidelines (Korea Ministry of Health & Welfare, 2015; U.S. Department of Agriculture, 2015), and federal and health care professional association Web sites in both the United States and Korea. In developing the Facebook program, usability principles for adolescents were followed (Barbour, 2007; Cheh, Ribisl, & Wildemuth, 2003; Chow, Smith, & Sun, 2012; Loranger & Nielsen, 2013). After the development phase was completed, four experts evaluated the program using heuristic evaluation, and revisions were made based on the findings. The development process and lessons learned from the development process have been discussed in detail in another article (Park, Nahm, & Rogers, 2015).

Before a program is implemented, it is important to determine if it is appropriate for use by the intended users. Adolescents differ from adults in terms of Internet usage behavior and what they expect to see (Loranger & Nielsen, 2013). In this study, usability was defined